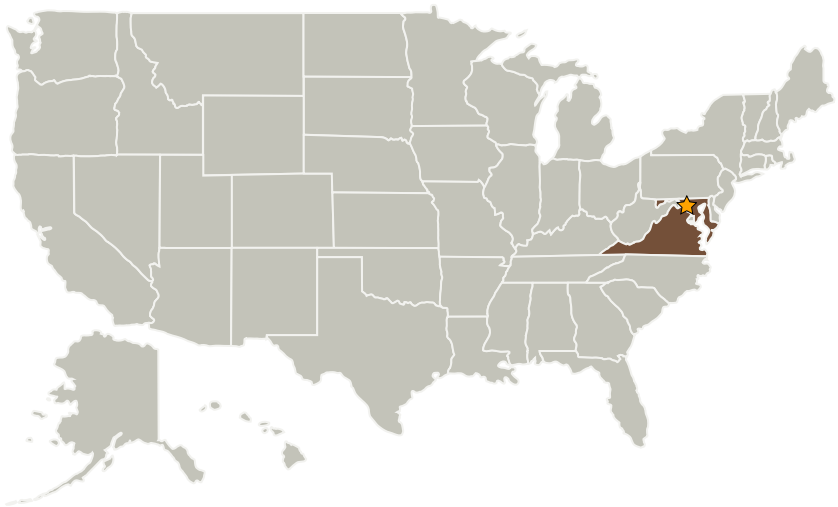
Schottky Heterodyne Receivers with Full Waveguide Bandwidth, Phase II

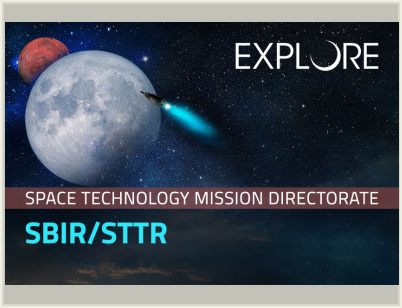
Completed Technology Project (2008 - 2011)

Project Introduction

This proposal is responsive to NASA SBIR Subtopic S1.03: Passive Microwave Technology, specifically the fourth bullet item; "Low noise (<2000 K DSB), compactly designed (< 8 cm3), heterodyne mixers requiring low local oscillator drive power (<2 mW) with RF input frequency between 100 GHz to 1 THz." The proposed research is significant not only for the development of Schottky mixers that meet these requirements, but also for the creation of a receiver system, including the LO chain, that achieves the goals of high sensitivity, compact size, low total power requirement and operation across complete waveguide bands. The proposed receivers will meet all of the requirements for high resolution spectroscopic studies of planetary atmosphere's (including the Earth's) from spacecraft, as well as airborne and balloon platforms. The final contract deliverable will be a breadboard receiver module suitable for use on the proposed Vesper mission to probe the atmosphere of Venus. Perhaps more importantly, their exceptionally broadband performance, compactness and reliability will make them ideal for the broader range of scientific and commercial applications, which includes the extension of sophisticated test and measurement equipment to 1 THz and the development of low cost imaging systems for security applications and industrial process monitoring.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Virginia Diodes, Inc.	Supporting Organization	Industry	Charlottesville, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

December 2008: Project Start

March 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves